

NOTES ON AUSTRALIAN DIPTERA. XXV.

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(Communicated by Dr. G. A. Waterhouse.)

(Eighteen Text-figures.)

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The present paper contains, besides some additional data on four families that have been already dealt with to some extent in this series, a revision of the species of the calliphorid subfamily Metopiinae, and some notes on Empididae.

I have to a large extent recently neglected the smaller forms from Australia, of which I still have many submitted to me by the late Dr. E. W. Ferguson and others, but, in view of the greater amount of interest generally evinced in the Tachinidae and similar families, I have deferred working up the many species of such families as Chloropidae that are yet before me.

Family ORTALIDAE.

Subfamily PLATYSTOMINAE.

I am as yet not in possession of sufficient material to present a synoptic key to the genera of this subfamily; in fact I am not in possession of a sufficient number of the genera of the family to give a generic key for any other subfamily of it.

Genus POGONORTALIS Hendel.

POGONORTALIS DOCLEA Walker.

Some specimens named by Coquillett *Rivellia doclea* Walker, in the United States National Museum, are identical with *barbifera* Hendel and are evidently correctly named. The species will, therefore, be known as *Pogonortalis doclea* (Walker). It may be noted that Hendel uses the name *barbata* in his generic key for the genotype, but in the text he uses *barbifera*. The above synonymy prevents any question being raised as to which of Hendel's names ought to be used.

Genus EUPROSOPIA Macquart.

EUPROSOPIA CONJUNCTA Hendel.

In connection with the separation of this species from *separata* Hendel in my key, it must be noted that the character of the scale-like hairs of the abdominal tergites applies to the males only, the females in both species having the apex of the first visible tergite only with scale-like yellow hairs. It would appear worth noting that, in addition to the character of the connected apical and preapical dark marks on the wing, the present species has the tegular process produced forward at least as far as the base of the posterior notopleural bristle, while *separata* has it produced only to the hind margin of the mesopleura.

Three females, Kuranda, Qld., no other data (F. P. Dodd).

## EUPROSOPIA MACROTEGULARIA Malloch.

Eight specimens including both sexes, Mt. Molloy, Qld. (F. H. Taylor).

## EUPROSOPIA PUNCTIFACIES Malloch.

One female, Kuranda, Qld. (F. P. Dodd).

The tegulae are very short, extending to pleural suture as in *separata*. The species was described from the male only.

A striking feature of this species is the presence of four vertical bristles, all the other Australian species known to me except *miliaria* Hendel having but two verticals. The fourth visible tergite in the female is similar to the third in colour and texture, and there is no indication of a pair of dorsal subapical spiracles on the dorsum, in contradistinction to *biarmata* Malloch, *conjuncta* Hendel, and *separata* Hendel, in which there is a white-fringed spiracle on each side close to apex of dorsum. In *scatophaga* Malloch this pair of spiracles is much closer together and clear of the hind margin of the tergite.

## EUPROSOPIA MACULIPENNIS Guérin.

I included this species in my first key to the species of this genus on the basis of the record by Hendel and his figure of the wing. I have now before me two examples and desire to add some notes on the species.

Hendel's figure of the wing, although photographic, does not show the apical markings as distinctly as is the case in my material, both of the latter specimens having a distinct, though not conspicuous, fuscous fascia over the outer cross-vein which is to a greater or lesser extent broken by pale marks in its field, especially in the marginal cell where it is represented by three or four small spots. It will thus be necessary to qualify my statement in the key in which I state that there is no fascia beyond the middle of the wing, the series of dark markings being possible of acceptance as a fascia in the more fully marked examples. However, the other characters are correct and no doubt the key will serve its purpose until I get sufficient material to enable me to draw up a more reliable one based upon a knowledge of the variations in this and other species.

Hendel was in error in stating that there are but six scutellar bristles, as in the male and female before me there are eight. The abdomen in the female has pale lanceolate hairs at apices of first and second visible tergites, the male has such hairs at apices of first to third and on disc of third and fourth tergites. The facial carina is granulose. Tegulae almost unproduced forward in either sex.

Locality: Brisbane, Qld., 2.12.1913 (H. Hacker). Baker collection, United States National Museum.

## EUPROSOPIA TENUICORNIS Macquart.

Although I included this species, which is the genotype, in my synoptic key to the species, I did not record it as amongst the available species. It has now come to hand from Mr. F. H. Taylor, but only the female is represented in the series of six examples.

Structure of tegular process as in *conjuncta*, arista bare at base, scutellum without any indication of an apical central sulcus, evenly rounded and with six bristles, lateral portions of apices of first to third visible tergites with pale yellow lanceolate hairs, least noticeable on third tergite.

Locality, Sydney, N.S.W., February, 1928 (F. H. Taylor).

No more definite record has been published for this species than Australia up to the present. Macquart's record for Tasmania is undoubtedly an error.

EUPROSOPIA BIARMATA Malloch.

Fortunately a female of this species has been submitted by Mr. Taylor, so that at least one specimen will be available for comparison in some Australian museum. This example is identical in all respects with the type specimen which has to be returned to the Deutsches Entomologisches Museum.

As indicated in my original description, the species will not run into either of the two divisions of my synoptic key, because of the very slight apical sulcus and dark brown glossy lateral areas of the scutellum. It finds its closest affinities in the *separata* group, as none of the other species now known to me has the scutellum glossy laterally at apex, all having very distinct and dense greyish dust on the entire surface.

Locality: Tully, Qld., October, 1925 (F. H. Taylor).

EUPROSOPIA SCATOPHAGA, n. sp.

♀. A smaller species than *macrotegularia*, but resembling it in the marking of the wings, except that they are more evenly reticulated at bases and the fascia over the other cross-vein is broader and more intersected on costa with pale marks so that it resembles a broad-limbed V.

Head clay-yellow, frons fulvous yellow, with irregular dark dots and small marks centrally and in front and the upper lateral margins dark, the upper orbits overlain with pale dust; face with a dark mark from middle of each antennal fovea to mouth-margin, labrum with a dark mark on each side; palpi fuscous, yellow at bases and apices; antennae brownish testaceous. Thorax as in *macrotegularia*, dorsum with dark-brown vittae which are much interrupted, three dark marks at base of scutellum; pleura without dark dots, but shaded with dark-brown on parts. Abdomen with the tergites blackish-brown, sides of anterior half of first visible tergite and two rather indistinct central anterior marks on third pale-grey dusted. Legs fuscous, basal half or more of each tibia fulvous yellow, basal segment of each tarsus, except the extreme apex, white. Wings rather evenly marked with fuscous streaks and spots, the most conspicuous being a fascia over inner cross-vein which is darkest on costa and tapers off behind, and a V-shaped fascia over outer cross-vein which is not connected with the apical spot, the latter with a pale mark at centre, and numerous small dark marks between the fasciae and basal of the one over inner cross-vein. Halteres yellowish-brown. Mesonotum with dark hairs except on posterior margin, scutellum pale haired except at base, pleural hairs partly pale and partly dark.

Arista bare; third antennal segment extending to below middle of face; facial carina microscopically transversely striate. Scutellum with a slight apical central depression or sulcus and six bristles, not glossy on sides. Abdomen with scale-like yellow hairs on apex of first visible and sparsely over entire surface of second, third and fourth tergites. Legs normal. Tegular process short, extending to suture, lower process lacking or minute.

Length, 7-8 mm., exclusive of ovipositor.

Type and six paratypes, Eungella, via Mackay, Qld., altitude 2,300 feet, March 1, 1929, on horse dung (F. H. Taylor).

This species is another one which does not fall into either of the two initial segregates in my key, having a distinct apical sulcus and no glossy lateral areas on the scutellum.

Genus LAMPROGASTER Macquart.

In a recent paper on Australian species of this genus I believe I mis-identified one of van der Wulp's species and below offer a few notes to clear up the situation.

LAMPROGASTER ELONGATA van der Wulp.

I identified as this species two examples from Cairns, N. Queensland. These agree very closely with the description of *elongata* and, were it not for the fact that I am now in possession of a series of specimens which differ in a few essential features while agreeing in the main with the Australian specimens, I would still be of the opinion that the latter represented van der Wulp's species. The new material is from Papua, the original locality of the species, and the weight of evidence appears to justify my decision that these, and not the Cairns examples, represent the true *elongata*.

It is opportune that I present a few additional characters which modify my key in the paper just referred to. The changes are embodied in the following paragraphs.

3. Mesonotum with a well developed pair of prescutellar acrostichals; humeral bristle present; general colour of thorax and abdomen rufous, with a conspicuous metallic-blue tinge, the mesonotal hairs and bristles black; scutellum slightly sulcate in centre at apex; fourth wing-vein not conspicuously curved forward at outer cross-vein, practically straight on its apical section, the first posterior cell slightly and gradually narrowed from outer cross-vein to apex ..... *pseudelongata*, n. sp.
- Mesonotum without a distinguishable pair of prescutellar acrostichal bristles, the other characters not as in above combination; fourth wing-vein always very noticeably bent forward at outer cross-vein, the first posterior cell much narrowed from there to short of middle of apical section of fourth vein, and practically parallel-sided from there to apex ..... 4
4. Humeral bristle well developed; general colour of thorax and abdomen deep metallic violet-blue; face testaceous, with a dark streak on each side from antennal fovea to mouth; mesonotum with the hairs and bristles dark; mid tibia with one or two strong black apical ventral spurs; ventral surface of scutellum much paler than dorsal, yellowish; second vein of wing not at all undulated apically ..... *xanthoptera* Hendel
- Humeral bristle lacking; face testaceous, without well defined dark lateral streaks; ventral surface of scutellum not paler than dorsal, scutellum either all blue or yellowish; second wing-vein distinctly undulated apically ..... 4a
- 4a. Thorax and abdomen metallic violet-blue, dark haired; mid tibia with a strong black apical ventral spur ..... *elongata* van der Wulp
- Thorax and abdomen testaceous yellow, with a more or less evident blue or violet suffusion, the hairs on both yellow; mid tibia with the apical ventral spur yellow or pale-brown ..... *sciotypa* Hendel

There are so few characters for the distinction of the above species outside of those included in the diagnosis that descriptions may be dispensed with.

Locality: Papua (F. P. Dodd). Ten specimens, including both sexes.

LAMPROGASTER PSEUDELONGATA, n. sp.

♀. This species agrees very closely with the preceding one, differing in being less intensely violet blue, the thorax and abdomen showing a brownish ground colour through the metallic suffusion, while in *elongata* this is rarely evident



except on the thorax. The structures mentioned in the synopsis, by means of which I am distinguishing the species, are not mentioned in Hendel's paper. I figure the apical portions of the wings of the two species to demonstrate more clearly the differences in venation (Figs. 1 and 2). The apex of the scutellum

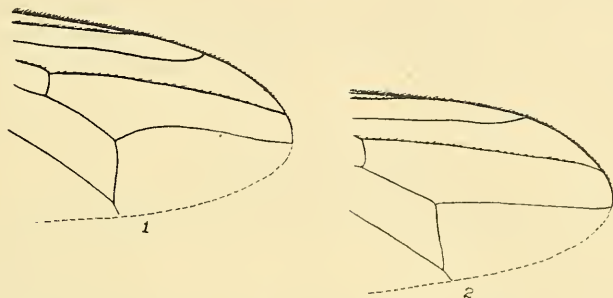


Fig. 1.—*Lamprogaster elongata*. Apex of wing.

Fig. 2.—*Lamprogaster pseudelongata*. Apex of wing.

in the new species has a rather evident but shallow depression or sulcus in centre between the apical bristles, which is not distinguishable in *elongata*.

Type and one paratype, Cairns, N. Qld., 1907 (Coll. Lichtwardt). Type in Deutsches Entomologisches Museum, Berlin-Dahlem, paratype deposited in Australian Museum by the author, on authority from Dr. Walther Horn.

I have no additional data on the other species listed in the key above.

#### LAMPROGASTER FUSCIBASIS, n. sp.

♂, ♀. General colour tawny or pale-brownish testaceous, with variable subcutaneous dark dots on face and thorax, which may not be normal, frons variably darkened centrally, thoracic dorsum with traces of four dark vittae which are not at all clearly defined, the scutellum sometimes darkened in part on disc, abdomen paler than thorax, without dark markings, sometimes with a bluish or violaceous lustre that is not very distinct. Legs pale. Wings yellowish, with a brownish or fuscous cloud at bases, which extends over costal half or more and to the apices of the basal cells, and is most distinct over the veins closing the latter, the costa yellowish, most intensely so, in the stigmal region, inner cross-vein quite distinctly clouded with brown. Calyptres yellowish-brown, margin of upper one darker; halteres yellowish-brown.

Head of the same type as that of *viola* Malloch, adhering rather closely to the anterior margin of thorax, and without a deep concavity on upper occiput; frons half of the head-width, with the usual four vertical bristles; arista short-haired on basal half; genal bristle pale and short. Thorax with bristling as in *pseudelongata*, but the scutellum is without fine hairs and has usually ten marginal bristles. Abdomen broadly ovate, the first visible tergite adhering quite closely to metanotum and with a deep rounded excavation in front, which is defined by a sharp edge. Legs normal, the mid tibia with two or three black apical ventral spurs. Wing-venation similar to that of *pseudelongata*, except that the second vein is almost straight.

Length, 13 mm.

Locality: Kuranda, Qld., no other data (F. P. Dodd). Type, male, allotype, female.

This is the most robust species of the genus known to me and, unless it has lost some of its usual colour, the dullest-coloured one. In Hendel's key to the species of the genus it runs fairly well to *basalis* Walker, but an examination of the description of that species shows clearly that it is distinct from it both in colour, and in the bare scutellum and less densely haired thorax and abdomen. In my key it will run to Caption 9, but it does not fit in either of the segregates there defined.

Family SAPROMYZIDAE.

Genus SAPROMYZA Fallen.

SAPROMYZA LICHTWARDTI, n. sp.

♀. Head clay-yellow, frons dark-brown, opaque, shining and yellow on a narrow line on each side and the orbital stripes; upper half of occiput dull-brown; face without dark marks; antennae and aristae black; palpi yellow. Thorax clay-yellow, mesonotum, scutellum, and metanotum fuscous brown, the first-mentioned with slight pale-grey dusting. Abdomen yellowish-brown, the tergites possibly variable in depth of colour. Legs yellow, fore pair black from basad of middle of femora to apices of tarsi, mid and hind pairs with apices of femora and tibiae deep-black, bases of tibiae and apical two or three segments of tarsi darkened. Wings hyaline. Halteres yellow.

Frons nearly one and a half times as long as wide; ocellars short and fine; longest hairs on arista about twice as long as its basal width; general structure as in *alboatra* Malloch. Thorax as in that species; intradorsocentral hairs in about eight series; anterior sternopleural undeveloped; prosternum with a few hairs. Mid tibia with one long apical ventral bristle; hind femur without apical anteroventral bristles; fore femur without an anteroventral comb. Inner cross-vein close to middle of discal cell; ultimate section of fourth vein but little longer than penultimate section.

Length, 7.5 mm.

Type, Herberton, N. Qld., 3,700 feet, January, 1911 (Dodd).

Type in Deutsches Entomologisches Museum, Berlin-Dahlem, Germany.

This species will run down to Caption 23 in my recently published key to the species of this genus, but will require a new segregate, because the frons is neither entirely black, nor entirely yellow, being brown with pale orbital stripes. The black palpi distinguish the species from *alboatra* Malloch and *brevicornis* Malloch, the two species in the section with black frons. In the published key, *mariae* is used at the second segregate of Caption 24 instead of *brevicornis* Malloch, an error which I am unable to account for, as the species are not at all similar and *mariae* occurs subsequently in the key at its proper place.

Family CLUSIOIDIDAE.

The family Clusioididae is the same as Heteroneuridae and Clusiidae of authors. Only one species is as yet recorded from Australia, to which I now add a second one.

Genus HETEROMERINGIA Czerny.

The new species may be distinguished from the one already described by means of the following characters:

- A. Wing with a faint fuscous cloud which extends from costa to a little beyond fourth vein on slightly less than the apical half; halteres black ..... *imitans*, n. sp.
- AA. Wing with three quite conspicuous blackish fasciae, the basal one narrow and extending entirely across wing, the second one broader and enclosing the two cross-veins, connecting with a broader apical fascia along costa, and less distinctly so with it along hind margin of wing; halteres with yellow knobs ....  
..... *australiae* Malloch

HETEROMERINGIA IMITANS, n. sp.

♀. Almost identical with *australiae* in colour and markings, the principal distinctions lying in the features listed in the above synopsis, and in its having black palpi, and the fore femur with a smaller dark apical spot. Structurally the two species are very similar, both of them having the ocellars very small, a character which distinguishes them from *nigrimana* Loew of Europe, to which *imitans* is very similar in other respects. The yellow coxae and femora, and faintly marked wings should readily distinguish the species from the European form.

Length, 3.5 mm.

Type, Cairns, N. Qld., 1907 (Coll. Lichtwardt, Deutsches Entomologisches Museum).

The type specimen is the only one available and it must be returned to the museum to which it belongs. I consider, however, that there will be no trouble experienced in distinguishing it when it is again collected. As already pointed out, the species may frequently be found upon fallen tree-trunks in shade and, wherever the insects are present, patient and careful collecting will disclose that they are not as rare as their infrequent occurrence in collections would appear to denote.

Family NEOTTIPHILIDAE.

Genus TAPEIGASTER Macquart.

I have recently received from Dr. Walther Horn, examples of two species of this genus, previously unknown to me, and below I present a key for the identification of the species. It should be noted that the upper mouth margin (epistome) in *marginifrons* is quite prominently produced, contrary to Bezzi's statement in his key, and that this species is more closely related to *argyrospila* than to the other species.

Key to the Species.

- 1. Hind femora not noticeably stouter than mid pair; epistome transverse, or almost so, but little produced beyond vibrissal angle ..... 2  
Hind femora distinctly stouter than mid pair; epistome produced centrally well beyond level of vibrissal angle ..... 4
- 2. Mid and hind femora slender, about equally thick, fore pair quite noticeably stouter than either pair, fore and mid pairs with two series of rather short black spines on less than the apical half, one on the anteroventral and the other on the posteroventral surface; femora with black mark at apices, none on central portion; tibiae without long hairs; hypopygium of male without any dorsal process ..... *fulva* Malloch  
Mid femora distinctly stouter than hind pair, all pairs with a median dark mark or ring; second hypopygial segment of male with a pair of processes ..... 3
- 3. Tibiae of at least the mid and hind legs with dark basal annulus; processes of second hypopygial segment prominent, pointed, and slightly curved .....  
..... *annulipes* Macquart  
Tibiae all lacking a dark basal annulus; processes of second hypopygial segment short and blunt ..... *luteipennis* Bezzi



4. Antennae black or fuscous; rather slender species, testaceous brown in colour, with a broad central grey-dusted vitta on the mesonotum, which may be more or less divided by longitudinal dark lines; abdomen grey-dusted, each tergite with a more or less evident brownish spot on each side of anterior half . . . . .  
 . . . . . *marginifrons* Bezzi
- Antennae fulvous yellow, but slightly darkened; species fulvous yellow in colour, mesonotum greyish-dusted; abdomen shining fulvous yellow, with a black dorsal mark over apical half of second, all of third and fourth visible tergites . . . . .  
 . . . . . *argyrospila* Bezzi

TAPEIGASTER ANNULIPES Macquart.

One male, Katoomba, Blue Mts., N.S.W., 3,400 feet, 1912 (Dodd). Lichtwardt collection.

TAPEIGASTER MARGINIFRONS Bezzi.

This is apparently the commonest species of the genus, judging from the number of specimens that I have examined.

Sunbury, Vict., and specimens with same locality and date as the preceding species. Lichtwardt collection. Thirteen specimens.

TAPEIGASTER ARGYROSPILA Bezzi.

This species is considerably stouter than any of the others and more brightly coloured, the dark dorsal mark on the abdomen standing out quite conspicuously. It may be noted that the epistome is not always bituberculate, as one of the specimens before me now has the tubercles almost undeveloped.

Male and female, Sunbury, Vict., Lichtwardt collection.

Bezzi had only the male before him when he described the species, and this is the only subsequent record of the species.

TAPEIGASTER FULVA Malloch.

I have seen only the original material of this species.

TAPEIGASTER LUTEIPENNIS Bezzi.

This species is yet unknown to me.

Family CALLIPHORIDAE.

Subfamily METOPIINAE.

The family Calliphoridae, which I have dealt with to some extent in a previous paper in this series, is distinguished from Tachinidae by the lack of a prominently rounded postscutellum, and the exposed second abdominal sternite, the latter overlying the lateral edges of the second tergite.

The Metopiinae are readily distinguished from most Calliphoridae by the bare or microscopically, pubescent arista, in which respect they agree with most Tachinidae, but there are many genera of Calliphoridae outside of this subfamily, which have the arista bare or almost so, and it is difficult to distinguish metopiine species from such genera. Up to the present, I have seen no genus from Australia that could be the cause of doubt as to its position either in Calliphorinae, Sarcophaginae, or the present subfamily, though it is quite possible that such may exist. The situation, therefore, is not as difficult here as in America where a number of rather doubtful forms occur, and for present purposes one may accept as belonging to Metopiinae all species having hypopleural bristles, that lack a



well developed postscutellum, have the second abdominal sternite overlying the edges of its tergite, the arista bare or almost so, the stem-vein of the wing bare on its basal section above, the lower calypter bare, the occiput dusted on each side of upper half, and the notopleural bristles usually two in number. It is worth mention that the prosternum and postalar declivity in all Australian species known to me are bare, the palpi are always present, the first posterior cell of the wing is always open and ends at some distance before apex of wing, the abdomen has always bristles on dorsum, sometimes reduced to those at apex of third visible tergite, and the lower calypter is widened behind, and more or less bulged up basally.

So far as we know at present, the females are viviparous, and the larvae live in the nests of Hymenoptera-Aculeata, generally in those of fossorial forms, the habits of the flies in pursuing their prey-laden hosts being the basis for many interesting notes in various entomological journals.

In attempting to make use of the generic key given below, it must be distinctly understood that it is applicable to only the Australian material available to me at this time. In North America there are some species referred to one or more of the included genera, which would not run out at the proper position in the key, but these are exceptional and need not interfere with the use of the key for the purpose of identifying native species. It may be pertinent to note that the region I refer to as the "notopleural triangle" is the slightly depressed and more or less triangular region at each side of the transverse suture, the lateral margin of which supports the notopleural bristles. The presence of numerous hairs on this region in the Australian species of the genus *Protomilto-*  
*gramma* Townsend has caused me to retain this as a valid genus, though it is very closely similar to *Senotainia* Macquart, and may yet be united with it.

*Key to the Genera.*

1. Propleura haired in centre ..... 2  
    Propleura bare in centre ..... 3
2. One or both of the notopleural bristles duplicated, the adjacent hairs long and strong; fore tibia with two subequal preapical dorsal bristles; frontal orbits with two or more series of lateral hairs, and no strong proclinate outer bristles ..... *Austrometopia*, n. gen.  
    Neither of the notopleural bristles duplicated, the triangle otherwise bare; fore tibia with one outstanding preapical dorsal bristle; frontal orbits almost bare outside of the inner marginal bristles, except for two or three strong proclinate bristles ..... *Chaetometopia*, n. gen.
3. Parafacials each with a single series of quite long bristles near anterior margin extending to below middle of face; facial ridges with a few bristles above vibrissae of about the same length as those on the parafacials and extending upward almost, or quite, to the lowermost of the latter; first and third wing-veins partly setulose above ..... *Opsidiopsis* Townsend  
    Parafacials bare, or with microscopic hairs, if rather strongly setulose their entire width above is armed and not only the anterior margin; first wing-vein bare, third setulose at base ..... 4
4. No outstanding bristle at vibrissal angle, the series quite regular .....  
    ..... *Milto-*  
    ..... *gramma* Meigen  
    One of the bristles at vibrissal angle much longer than the others in the series on facial ridges ..... 5
5. Parafacials with strong black bristly hairs which are distinctly lengthened near anterior margin, especially below, the longest fully as long as width of parafacial at level of its base; postsutural dorsocentral bristles in three pairs and quite long; first posterior cell of wing much narrowed at apex, sometimes practically closed ..... *Acnigmatopia*, n. gen.

- Parafacials with very inconspicuous hairs, or bare; postsutural dorsocentral bristles in four pairs, the two or three anterior pairs short and weak, almost, or quite, indistinguishable from the adjacent hairs; first posterior cell of wing always quite distinctly open ..... 6
6. Frontal orbits with one or two series of strong black hairs laterad of the inner marginal series of bristles; vibrissae separated from each other by a much greater distance than either is from eye-margin, and situated at less than the length of second antennal segment from mouth-margin .....  
 ..... *Pachyophthalmus* Brauer & Bergenstamm
- Frontal orbits without series of noticeable hairs laterad of the inner marginal bristles, usually with two or more strong proclinate outer bristles on upper half; vibrissae separated from each other by a distance equal to, or shorter than, that of either from eye ..... *Protomillogramma* Townsend

#### Genus AUSTROMETOPIA, n. gen.

This genus is very similar in most respects to *Pachyophthalmus*, but is readily distinguished from it and all other genera of the subfamily known to me except one, by the haired central anterior portion of the propleura. The strongly haired notopleural triangle is characteristic of these two genera, though most of the Australian species of the subfamily have hairs present there and, like *Pachyophthalmus*, it has one or two series of quite well developed black hairs on each frontal orbit laterad of the inner marginal bristles. For other characters see description of the genotype.

Genotype, the following species.

#### AUSTROMETOPIA BURNSI, n. sp.

♂. Head black, occiput grey-dusted, postocular orbits, cheeks, face, and frontal orbits yellow-dusted, sometimes almost golden; antennae, aristae, palpi, and cephalic hairs black. Thorax and abdomen black, with grey dusting, the former with three broad shining black vittae which are traceable over the scutellum, abdomen with three shining black subtriangular marks on each tergite, less distinct on the first and fourth. Legs black. Wings greyish hyaline. Calyptrae yellowish-white. Halteres brown.

Eyes subnude, with the facets of the central anterior portion enlarged; frons at vertex about half as wide as either eye, interfrontalia complete, about as wide as either orbit above, narrowed below, each orbit with a series of incurved inner marginal bristles, laterad of these two or more series of rather strong black hairs, one strong recurved bristle near upper extremity, and the hairs continued slightly below bases of antennae; parafacials generally bare; outer pair of vertical bristles much shorter than inner pair; ocellars and postverticals practically undeveloped; profile as Figure 3; aristae subnude; vibrissae situated slightly above epistome, separated by a distance about one and a half times as great as that of either from eye; palpi normal. Thorax with only the posterior presutural and two posterior pairs of postsutural dorsocentrals well developed; prealar of moderate length; sternopleurals variable, sometimes one or two below both the anterior and posterior bristles; sides of scutellum quite densely haired on basal half or more. Abdomen subcylindrical, slightly tapered to apex, first to fourth visible tergites each with quite strong apical central bristles. Tarsal claws and pulvilli moderately large, no exceptional tarsal armature on any of the legs; fore tibiae without noticeable ventral setulae, with two posterior bristles, and the anterodorsal setulae fine; mid tibia with one anterodorsal, one ventral, and two posterior bristles; hind tibia with rather irregular anterodorsal and

posterodorsal bristles, and one anteroventral bristle. Inner cross-vein of wing distinctly proximad of apex of first vein; first posterior cell open, ending in costa before tip of wing.

Length, 6.5-7 mm.

Type, and three paratypes, Meringa, N. Qld., 28.6.1926, "Parasitic on Eumenid" (A. N. Burns). Named in honour of the collector.

#### Genus PACHYOPHTHALMUS Brauer & Bergenstamm.

This genus is found in North America and Europe, the species living, in the larval stages, in the nests of various genera of solitary wasps. In my present material there is but one example of the genus, a female in rather poor condition which I am unwilling to identify specifically. It does, however, closely resemble *signatus* Meigen, the genotype, which occurs in Europe and North America. Pending receipt of more and better preserved examples of both sexes, I leave the matter of specific identity unsettled, though it appears possible the species is *signatus*.

Locality: Gordonvale, N. Qld., ex. mud wasp.

#### Genus OPSIDIOPSIS Townsend.

I am placing in this genus one Australian species which does not agree in all particulars with the genotype, *oblata* Townsend, a North American species. There is, however, a very close resemblance between the species and the characters in which they do not agree are not in every case considered as of generic import.

The peculiar armature of the parafacials is similar to that of *Metopia* Meigen, a genus not so far known to me from Australia, but one which may be expected to occur. The principal distinguishing character, by means of which it may be separated, is the setulose upper surface of the first wing-vein, *Metopia* having this vein bare. In the genotype of *Opsidiopsis* the first vein is setulose on the basal half above, while in the Australian species it is setulose on the apical half, and while in the latter the parafacials are practically bare except for the anterior marginal bristles, in *oblata* there are fine short hairs on almost their entire extent. In other respects the two agree very well.

Nothing is known of the larval habits of the genotype, and the new species has no indication on the label other than the locality and date.

#### OPSIDIOPSIS NUDIBASIS, n. sp.

♀. Black, thorax and abdomen slightly shining. Interfrontalia black, vertex grey-dusted behind the ocelli; frontal orbits, face including the parafacials, cheeks, and postocular orbits densely silvery-white-dusted. occiput grey-dusted; antennae and arista black, palpi fuscous. Thorax with grey dust, the mesonotum with four narrow incomplete black vittae, the submedian pair present only in front of suture, the sublateral pair interrupted at suture; sides of scutellum darker than disc. Second to fourth visible tergites of abdomen each with a rather broad fascia of grey dust near base, which is interrupted centrally. Legs black. Wings greyish hyaline. Calyptae yellowish-white. Halteres brown.

Eyes bare, facets very slightly enlarged centrally in front; frons at vertex about one and a half times as wide as either eye, interfrontalia in front of ocelli twice as wide as either orbit, slightly narrowed anteriorly. All four verticals long, postverticals short; vertex rather sharp, ocelli as far from vertex as they



are from each other, ocellar bristles long, proclinate, and divergent; each orbit with about eight inner marginal bristles, all but the upper one incurved, the upper reclinate, and laterad of these on the upper half two sets of two bristles, the inner pair recurved, the outer pair proclinate and slightly lower placed, a few fine black hairs laterad of the bristles, the lowermost descending to level of apex of second antennal segment; profile as Figure 4; frontal lunule distinctly haired; face not widened below; vibrissae close to epistome, separated by about three times as great a distance as either is from eye. Thorax with two plus three pairs of strong dorsocentrals, notopleural triangle without fine hairs; apical scutellar bristles shorter than the two pairs of laterals and cruciate, sternopleurals one plus one. Abdomen tapered to apex, second and third visible tergites with a pair of strong apical central bristles, fourth with a series of such bristles. Fore tarsi slender; fore tibia with one posterior submedian bristle and a series of minute anterodorsal setulae; mid tibia with one anterodorsal bristle, about four short posterior bristles, and no ventral bristle; hind tibia with about four anteroventral, posterodorsal, and anterodorsal bristles, one of the latter much longer than the others. Inner cross-vein proximad of apex of first vein; outer cross-vein at about one and a half times its own length from the bend of fourth vein, the latter angular, apical section of the vein arcuate, first posterior cell ending well before apex of wing, rather narrowly open, apical section of fifth vein about half as long as preapical section; first wing-vein setulose on about its apical third, third vein setulose above from its base to well beyond inner cross-vein and with about three short setulae at base below.

Length, 6 mm.

Type, Eidsvold, January 23, no other data. Submitted by Dr. I. M. Mackerras, and to be returned to him.

Unless my placing of this species is erroneous, the male ought to correspond closely with the female in cephalic characters and the above description should suffice for its recognition. In all probability the species occurs on sand and flies low over it, resembling certain Hymenoptera-Aculeata that occur with it.

It would appear to be worth noting, in connection with my doubt as to the generic position of the above species, that the arrangement of the fronto-orbital bristles in it is similar to that in *Metopia* and quite different from that found in the genotype of *Opsidiopsis*. In the latter, there are many short hairs on the orbits, amongst which there are two proclinate outer bristles on the upper half and one reclinate bristle which appears to belong to the inner series, but there are no intermediate reclinate bristles such as occur in *nudibasis*.

#### Genus MILTOGRAMMA Meigen.

This genus occurs in Europe but is lacking in North America and, while the character upon which it is separated from its allies in the key may appear at first sight a rather trivial one, it is usually sufficiently well marked to distinguish the species readily, the vibrissae in all the other genera always standing out as well differentiated bristles in the series which runs from the lower margin of cheek to a greater or lesser distance above the vibrissal angle, the latter being in all cases quite well defined. In all the Australian species the ocellar bristles are very weak, almost erect, and divergent, and the frontal orbits have outer proclinate bristles which are not as strong as in most of the other genera.

The Australian species now before me may be distinguished as in the following key. Unfortunately the species are poorly represented, and males are



almost lacking, so that good characters for their distinction are difficult to assemble.

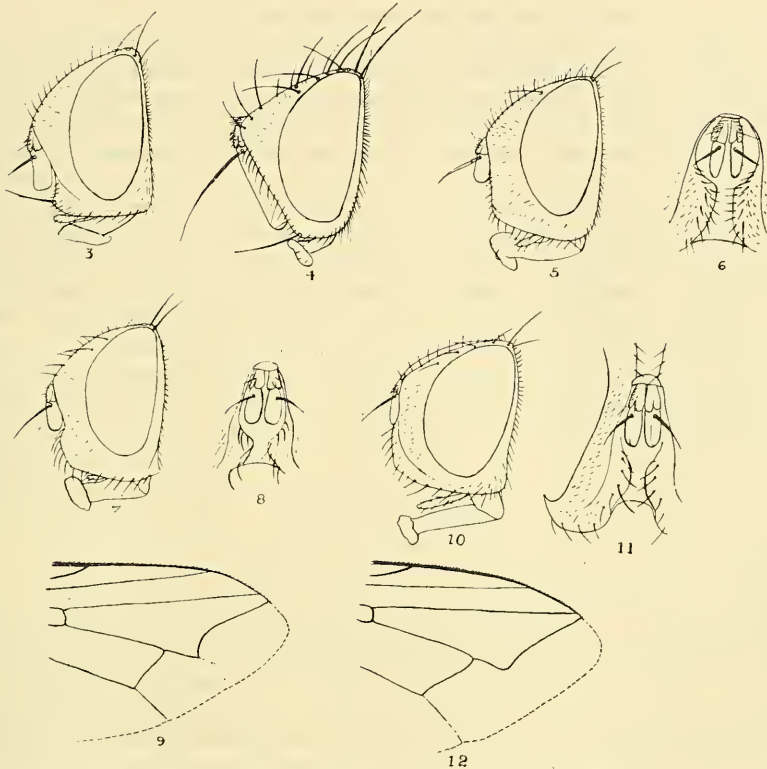


Fig. 3.—*Austrometopia burnsi*. Head from the side.  
 Fig. 4.—*Opsidiopsis nudibasis*. Head from the side.  
 Fig. 5.—*Miltogramma rex*. Head from the side.  
 Fig. 6.—*Miltogramma rex*. Face.  
 Fig. 7.—*Miltogramma rectangularis*. Head from the side.  
 Fig. 8.—*Miltogramma rectangularis*. Face.  
 Fig. 9.—*Miltogramma rectangularis*. Apex of wing.  
 Fig. 10.—*Miltogramma normalis*. Head from the side.  
 Fig. 11.—*Miltogramma normalis*. Face.  
 Fig. 12.—*Miltogramma normalis*. Apex of wing.

Key to the Species.

1. Thoracic dorsum with five distinct black presutural vittae ..... 2
- Thoracic dorsum with but four distinct black presutural vittae, the central one lacking ..... 3
2. Vibrissal bristles in more than one series ..... *rex*, n. sp.
- Vibrissal bristles in a single series ..... *regina*, n. sp.
3. Fourth vein very conspicuously bent beyond the preapical angle, the latter a distinct right angle; inner cross-vein slightly but distinctly proximad of middle of discal cell ..... *rectangularis*, n. sp.
- Fourth vein not very conspicuously bent beyond the preapical angle, the latter not a right angle; inner cross-vein slightly but distinctly beyond middle of discal cell ..... *normalis*, n. sp.

## MILTOGRAMMA REX, n. sp.

♂. Head testaceous yellow, interfrontalia brownish-red, frontal orbits, face including the parafacials, and cheeks yellow-dusted; occiput fuscous, yellowish-grey-dusted; antennae orange-yellow, third segment slightly darkened above; arista black; palpi orange-yellow; frontal hairs and bristles black, those on lateral margins of frontal orbits anteriorly, on parafacials and cheeks yellow, occipital hairs black. Thorax black, slightly shining and with rather dense grey dust, the mesonotum with five black vittae anteriorly, the submedian pair discontinued slightly behind suture, the others complete, the sublateral pair evident on sides of the scutellum, but the central one not evident there, the scutellum slightly yellowish apically. Abdomen testaceous yellow, darkened above, with a quite uniform and rather broad dorsocentral vitta and apices to tergites 2 to 4 brownish-black and slightly shining, first tergite entirely dark, the paler portions of the tergites yellowish-grey-dusted and dull, fifth tergite with the dark markings smaller than on the other tergites. Legs black, femora grey-dusted. Wings greyish hyaline. Calyptres yellowish-white. Halteres dark-brown.

Frons at vertex about one-fifth of the head-width, interfrontalia of uniform width throughout its length, at middle more than one and a half times as wide as either orbit, all four vertical bristles well developed, ocellar and postvertical bristles very small, each orbit with a rather closely placed series of hair-like inner marginal bristles, incurved below, almost erect on posterior third, one recurved stronger bristle at the upper extremity of series, and three to five proclinate outer bristles, the outer portions of orbits with fine hairs which are continued to lower level of eyes on the parafacials; frontal lunule bare; profile as Figure 5; armature of face as in Figure 6; anterior central facets of eyes slightly enlarged. Thorax with only the posterior pair of the presutural and postsutural dorsocentral bristles well distinguished from the surrounding hairs; notopleural triangle quite copiously furnished with long erect hairs; sternopleurals one or two plus three or four; scutellum with about ten marginal bristles of rather unequal lengths. Abdomen subcylindrical, tapered apically, sixth tergite with only fine apical hairs, no bristles. Fore tarsi without exceptional armature; fore tibia with about six or seven ventral setulae at middle forming the usual comb; mid tibia with one long ventral, one or two short posterior, and three or four longer anterodorsal bristles; hind tibia with a quite regular series of rather closely placed fine bristles on anterodorsal and posterodorsal surfaces, and two to four anteroventral bristles. Inner cross-vein of wing close to middle of discal cell, apical section of fourth vein distinctly arcuate.

Length, 10 mm.

Type, King George's Sound, W.A., no other data (Australian Museum).

## MILTOGRAMMA REGINA, n. sp.

♀. A darker species than the preceding one, without trace of yellow on the scutellum, and dorsal exposure of abdomen. In other respects very similarly coloured and marked.

Structurally distinguished by the uniseriate vibrissal series of bristles. The frons is also narrower, but this is a character of the female of most of the species in this subfamily. The apical section of fourth vein is also more pronouncedly bent than in *rex*.

Length, 8.5 mm.

Type, Eidsvold, Qld. (Bancroft).

It is possible, but hardly probable, that this is the female of *rex*.

MILTOGRAMMA RECTANGULARIS, n. sp.

♀. Very similar in colour to the preceding species, but the dusting is more yellowish or brownish, the mesonotum lacks the central black vitta before the suture, the others are not so sharply defined, and the markings of the abdomen are more diffuse, the apical black fascia being rounded in front on each side and rather changeable when viewed from different angles. Knob of halteres yellowish.

Frons at vertex fully one-fourth of the head-width; interfrontalia at middle about one and a half times as wide as either orbit, the inner marginal bristles stronger than usual in the genus; profile as Figure 7; vibrissal series of bristles much stronger than in the next species (Figure 8). Thorax as in the preceding species, scutellum not at all yellowish at apex and with eight marginal bristles, including the basal one which is situated above the margin. Abdomen tapered apically, the apical bristles on tergites three and four short. Fore tarsus very slightly widened, mid tibia with one long and one short ventral bristle, the legs otherwise as in *regina*. Venation of wings as stated in the specific key, apical section as Figure 9.

Length, 7.5 mm.

Type, Sydney, N.S.W., 4.2.1924 (Health Dept).

MILTOGRAMMA NORMALIS, n. sp. ♀

♀. Similar to the preceding species, but the dark thoracic vittae are rather bronzy, and the abdominal markings are more extensive.

Structurally distinguished by the characters listed in the key and the weaker series of bristles on the vibrissal region (Figures 10-12).

Length, 7.5 mm.

Type and one paratype, Kalgoorlie, Southern Cross, W.A., 13.11.1924 (Nicholson).

Genus CHAETOMETOPIA, n. gen.

This genus is very similar in general characters to *Senotainia* Macquart, and *Protomiltoграмма* Townsend, but it differs from both of these in having some strong black hairs in centre of the propleura, a character which is possessed by only one other genus of the subfamily known to me and described in the present paper. This character alone will readily distinguish the genus from its allies, though it is not improbable that others as yet unknown to me may possess a similar character.

Genotype, the following species.

CHAETOMETOPIA CINEREA, n. sp.

♂. Head testaceous, occiput fuscous, entirely whitish-grey-dusted, the interfrontalia fuscous, and when viewed from behind without white dusting; antennae black, base of third segment narrowly reddish; palpi testaceous yellow. Thorax and abdomen black, densely grey-dusted, the former with five presutural black vittae on mesonotum, the submedian pair disappearing a little behind suture, the sides of the scutellum blackish; abdomen with the usual five series of black tergal spots, but in the type specimen they are sharply margined only when seen



from behind, the submedian spots narrow, extending the entire length of tergites. Legs black. Wings hyaline. Calyptres white. Halteres yellow.

Frons at vertex a little less than one-fourth of the head-width, parallel-sided, orbits a little narrower than interfrontalia, each with two strong forwardly-directed outer bristles, an inner series of incurved bristles, and one upper recurved bristle, as well as some microscopic lateral hairs; outer pair of verticals not half as long as inner pair; postverticals minute; ocellars of moderate length; parafacials with a few weak black hairs; profile as Figure 13; face as Figure 14; eyes with the anterior central facets slightly enlarged. Thorax with two plus three pairs of dorsocentrals, and one plus one pairs of acrostichals; two strong and three weak bristles on the presutural lateral area, no hairs on notopleural triangle; sternopleurals one plus one; scutellars six; stigmatal region with three bristles, the lower one very short and weak. Abdomen cylindrical, tapered to apex, first visible tergite without apical central bristles, second with a short pair, third and fourth each with a strong pair. Fore tarsi without exceptional armature; fore tibia with two posterior median bristles; mid tibia with one ventral, one anterodorsal, and two short posterior bristles; hind tibia with one anteroventral, and two or more anterodorsal and posterodorsal bristles; tarsal claws rather long. Third vein with a few weak setulae at base; inner cross-vein at middle of discal cell; apical section of fourth vein arcuate near angle.

Length, 4 mm.

Type, Darwin, Qld. (G. F. Hill).

I have before me what appears to be a second species of this genus from North Borneo, but am not dealing with it at this time, as I intend to make a report on the collection of which it forms a part in another magazine.

#### Genus PROTOMILTGRAMMA Townsend.

As already indicated in the foregoing pages, I have some doubts as to the propriety of retaining this as a good genus, the only character of note for its separation from *Senotainia* being the haired notopleural triangle, and some of the North American species of *Senotainia* have a few hairs on that portion of the thorax. There is, however, no species in Australia which appears to be intermediate and it is not really essential that the status be definitely decided at this time.

Some of the species have males in which there is a peculiar tufted appearance to the apex of the abdomen owing to the presence of numerous backwardly-directed bristles on the incurved lateral portions of the fourth visible tergite, but this is not a character that can be used as a generic criterion.

I give below a key for the separation of the species at present available.

#### Key to the Species.

1. Third antennal segment at least twice as long as the distance from its apex to mouth-margin ..... 2
- Third antennal segment much less than twice as long as the distance from its apex to mouth-margin ..... 5
2. Males ..... 3
- Females ..... 4
3. Wings entirely clear apically and posteriorly, quite conspicuously browned at bases on costal half, the dark colour fading out at or just beyond apex of first vein; neither frontal orbit at level of anterior forwardly directed outer orbital bristle as wide as interfrontal stripe; parafacial at middle not noticeably wider than third antennal segment ..... *cincta* Townsend



- Wings clear, almost whitish at bases, browned on apical half, more noticeably so along the courses of the longitudinal veins; either frontal orbit at level of anterior forwardly-directed outer orbital bristle quite distinctly wider than the interfrontal stripe; parafacial at middle much wider than third antennal segment . . . . . *laticeps*, n. sp.
4. Frons at vertex not more than one-fourth of the head-width . . . *cincta* Townsend  
 Frons at vertex one-third of the head-width . . . . . *laticeps*, n. sp.
5. Male; wings entirely hyaline; frons more than one-fourth of the head-width . . . . .  
 . . . . . *plebeia*, n. sp.
- Female; frons at vertex less than one-third of the head-width; central dark thoracic vitta not distinguishable over disc of scutellum . . . . . *plebeia*, n. sp.

PROTOMILTOGRAMMA CINCTA Townsend.

No mention is made in the original description of the dark bases to the wings of the male. I have examined the type material in the collection of the United States National Museum and the specimens now before me agree in all respects with it.

Localities: Eidsvold, Qld., December, 1922; Sydney, N.S.W., 8.1.1923 (Health Dept.); Glenreagh, N.S.W., 1.2.1923 (Health Dept.); Blue Mts., 21.3.1922 (Health Dept.). Four specimens, two of each sex.

PROTOMILTOGRAMMA LATICEPS, n. sp.

♂. Very similar to the preceding species in general coloration, but for the information of students I give a fairly full description, *cincta* having been described in a Canadian magazine in 1916.

Head testaceous yellow; orbits, face, and cheeks densely white-dusted, not silvery, occiput fuscous except on a quadrate area behind vertex, the dark part, including the postocular orbits, densely white-dusted; antennae and palpi testaceous yellow; aristae black. Thorax black, densely grey-dusted, especially on pleura, the mesonotum with five blackish vittae, the central three narrower, the one on each side of central one discontinued a little behind suture, the central one rather faint on its hind portion, scutellum largely black, all the dark portions of dorsum with a bronzy tinge. Abdomen black, sides of segments of basal half more yellowish, apices of tergites narrowly yellowish and with whitish dust, bases of tergites quite broadly whitish-dusted, the yellowish colour showing through on second and third visible tergites, and the black colour usually carried forward to anterior margins centrally, the basal tergite black on exposed dorsal surface. Legs black. Wings hyaline, distinctly browned on apical halves, most noticeably so along the courses of the veins and costally. Calyptres white. Halteres yellow.

Frons at vertex about one-third of the head-width, outer orbitals consisting of an upper backwardly-curved and two forwardly-directed bristles; inner margin of each orbit with about a dozen fine bristles, the upper three or four sloping backward, the others slightly inward and forward; head in profile as Figure 15, the slender part of arista much shorter than in *cincta*; face as Figure 16. Thorax with only one presutural and two postsutural pairs of dorsocentrals distinct from the surface hairs; sternopleurals one plus three. Abdomen cylindrical, slightly tapered to apex, second visible tergite without strong apical central bristles, third with the apical bristles weaker and less closely placed than in *cincta*, the fourth tergite without apical bristles; anal tuft not as prominent as in *cincta*. Fore tibia with the ventral series of setulae inconspicuous, mid tibia with a strong ventral bristle; hind femur with one rather long preapical anteroventral bristle.

two similar bristles near base on ventral surface, and some shorter and finer bristles opposite the latter on posterior surface, no fine hair-like bristles beyond the ventral pair; hind tibia with three or four anteroventral bristles, and some irregular anterodorsal and posterodorsal bristles.

♀. Similar to the male in most respects, differing mainly in the broader abdomen with more pointed apex.

In both sexes the parafacial hairs are pale and microscopic, very difficult to distinguish without the aid of a very strong lens.

Length, 6 mm.

Type, male, Sydney, N.S.W.. 24.10.1923; allotype, Kojarena, W.A., 6.9.1926 (E. W. Ferguson).

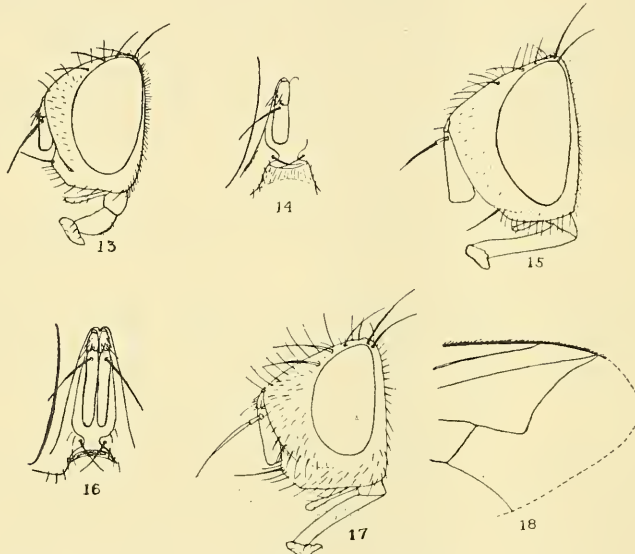


Fig. 13.—*Chaetometopia cinerea*. Head from the side.

Fig. 14.—*Chaetometopia cinerea*. Face, incomplete.

Fig. 15.—*Protomiltogramma laticeps*. Head from the side.

Fig. 16.—*Protomiltogramma laticeps*. Face.

Fig. 17.—*Aenigmatopia fergusonii*. Head from the side.

Fig. 18.—*Aenigmatopia fergusonii*. Apex of wing.

\* PROTOMILTOGRAMMA PLEBEIA, n. sp.

♂. Differs from the preceding species in having the frontal orbits and most of the parafacials yellow instead of white dusted, though in some lights the white colour may be distinguished, the scutellum is without dark marks except on sides, the dusting of thorax and abdomen is yellowish, and the abdomen is more extensively yellowish on sides; antennae with the third segment brown.

A stouter species than *laticeps*, with narrower frons and parafacials, shorter antennae, the vibrissae much higher above mouth-margin, arista tapered on apical half, the third visible abdominal tergite with stronger apical bristles, in addition to the characters mentioned in the key.

♀. Similar to the male, but the fourth visible tergite with some strong apical bristles.

Length, 7-8 mm.

Type, male, Sydney, N.S.W., 15.1.1923; allotype, same locality, 4.12.1921; paratype male, same locality, 30.3.1924 (Health Dept.); paratype female, Gundamaian, National Park, N.S.W., 14.2.1926 (Nicholson).

It appears to be worth noting that in both sexes in this genus there are four almost equally long vertical bristles, and in no case are the ocellars long or strong.

Genus AENIGMETOPIA, n. gen.

A peculiar genus, resembling in appearance some littoral Phaoniinae because of the grey colour and wide frons. Frons about one-half of the head-width, bristled as in the preceding genus, but the bristles much stronger, the parafacials exceptionally strongly setulose in front; profile as Figure 17. Dorsocentral bristles well developed both before and behind suture; sternopleurals one plus one. Abdomen flattened, ovate, with a pair of strong apical central bristles on second and third visible tergites and a complete series of strong apical bristles on fourth. First posterior cell of wing almost or quite closed in margin of wing (Fig. 18).

Genotype, the following species.

AENIGMETOPIA FERGUSONI, n. sp.

♂, ♀. Black, entirely grey-dusted, the parafacials and face more distinctly white-dusted; antennae and palpi black, mesonotum with faint traces of vittae in arrangement as in the preceding genus, abdomen slightly checkered on dorsum; legs black; wings greyish hyaline, veins fuscous, bright orange at bases; calyptrae white; halteres brown.

Ocellar bristles strong, divergent; outer orbitals generally four or five in number, the upper two recurved, the others proclinate, inner marginal bristles long; face not centrally carinate; profile as in Figure 17. Thorax with two plus three pairs of strong dorsocentrals and at least one pair of presutural acrostichals; prealar moderate in length; scutellum with six long marginal and two short discal bristles. Hypopygium of male small, semiconcealed. Legs much as in the preceding genus, but the ventral setulae on fore tibia inconspicuous; mid tibia with a long ventral bristle; hind femur as in *P. laticeps*; hind tibiae missing in male, that of female with one anteroventral and a number of rather irregular anterodorsal and posterodorsal bristles. Third wing-vein setulose above to beyond midway to inner cross-vein, and with one or two setulae at base below, apical venation as Figure 18.

Length, 7-8 mm.

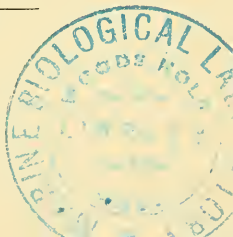
Type, male, Geraldton, W.A., 5.9.1926; allotype, Wyalkatchem, W.A., 1.9.1926 (E. W. Ferguson).

Named in honour of the collector who was responsible for my undertaking work on Australian Diptera and who collected this and many other interesting species which have passed through my hands.

Family EMPIDIDAE.

This family has recently been reviewed for New Zealand by Mr. J. E. Collin\* who records 102 species from that country, but there is no published work of any

\* "New Zealand Empididae", British Museum (Natural History), London, 1928.





note on the Australian species. Tillyard, in his book on the Insects of Australia and New Zealand, published an estimate of the number of Australian species as 50, but there may be many more, as nothing has been done on the family here. I have no material of any consequence from Australia, but have quite a number of species from New Zealand, and have seen additional species from that country in the collection of the United States National Museum.

The economic status of the family is rather doubtful. Although the adults are mainly if not entirely predaceous, feeding largely upon other small insects, and especially Diptera, this does not necessarily imply that the insects are beneficial. This habit, and also that of parasitism, is too often accepted as indicative of benefit to mankind, but unfortunately neither can invariably be classed as such. There are, of course, a number of species of parasitic insects that confine themselves largely, or entirely, to one, or a few very closely related, injurious species and in such cases the parasites may be depended upon to justify their introduction into certain areas where they do not naturally occur, for the purpose of curtailing enemies of man; but, on the other hand, many such insects may eventually, on the elimination of their normal prey, or hosts, become injurious through attacking other than their normal hosts, the later choice being in no manner injurious, or even beneficial.

The larvae of many of the Empididae are found in rotten wood, in the earth in woods, and in mud of stream and lake beds. The transformation is complete. The adults of many species may be taken flying over streams, in glades in woods, or on flowers. Certain species have peculiar mating habits, the males capturing insects with which they fly past a group of females dancing in the air, whereupon one of the females darts out from the group and flies to the male, both of them settling upon the herbage or continuing flying, but almost immediately after they come together they may be found *in copula*. Several interesting notes on this habit have been published in Europe and North America.

I do not purpose presenting at this time a survey of the material in my hands, as it is quite insufficient to justify a revision of the Australian species, but I give below a key to the subfamilies, which may be found of interest to anyone having species available. The included subfamilies are those known to occur in New Zealand with the addition of Hybotinae from Australia. Possibly two or three of these do not occur in Australia.

*Key to the Subfamilies.*

1. None of the longitudinal veins of wing furcate, discal cell always lacking, first basal cell not longer than second ..... *Tachydrominae*  
One or more of the longitudinal veins of wing furcate, or if all are simple the first basal cell is distinctly longer than second; discal cell usually present .. 2
2. Discal cell always present and with but two veins emanating from its apex, neither of them furcate ..... 3  
Discal cell present or absent, when present with three veins emanating from its apex, if with but two the upper one is furcate ..... 4
3. Anal cell distinctly shorter than second basal ..... *Ocydrominae*  
Anal cell longer than second basal ..... *Hybotinae*
4. Second antennal segment projecting forward into inner side of base of third in a finger-like process; anal cell of wing entirely lacking ..... *Ceratomerinae*  
Second antennal segment without a projection or process at apex on inner side .. 5
5. Fore coxae elongate, at least twice as long as either of the other pairs; anal angle of wings never developed; fore legs usually fitted for holding prey .....  
..... *Hemerodrominae*  
Fore coxae not noticeably elongated, not twice as long as hind pair ..... 6



6. Apex of anal cell of wing projecting beyond level of apex of second basal cell; mid femora distinctly thicker at bases than either fore or mid pairs, tapered to apices ..... *Homalocneminae*  
 Apex of anal cell not projecting beyond level of apex of second basal cell; mid femora not thicker than other pairs and not noticeably thickened at bases .. 7
7. Empodium pulvilliform, the apical segment of tarsi pointed at apex above ..... *Clinocerinae*  
 Empodium normally slender and bristle-like; the apical segment of tarsi blunt or truncate at apex ..... *Empidinae*

## Subfamily EMPIDINAE.

## Genus RHAMPIHELLA, n. gen.

This genus has the anal vein incomplete, fading out before attaining margin of wing, and without a weak portion just after leaving the apex of the anal cell, and the subcostal vein (mediastinal of Collin) connects with the costa. It also is noteworthy that the fore metatarsus of the male is much thickened, the hypopygium of the same sex is somewhat keel-shaped; and I can detect no hairs on the posterior apical margin of the hind coxae.

Genotype, the following species.

## RHAMPIHELLA INCONSPICUA, n. sp.

♂. Brownish fuscous, with grey dusting. Antennae and palpi testaceous yellow. Thorax in type greasy so that it is impossible to decide if it is vittate. Abdomen largely testaceous, darkened on dorsum and hypopygium. Legs testaceous yellow, hind femora largely blackened, mid pair faintly so, apices of all tarsi fuscous. Wings hyaline, with a faint stigmal darkening below apex of first vein. Halteres brownish.

Frons at narrowest point at least as wide as base of third antennal segment, the posterior ocelli widely separated, lying close to margins of eyes; ocellar triangle not much elevated and with microscopic hairs only, no distinct bristles; vertical hairs pale and fine; antennae inserted about middle of eyes, damaged in type, but the third segment apparently short, conical, and with a terminal style; face as wide as frons; eye apparently notched at base of antenna; proboscis short and stout, not as long as height of head, projecting straight forward in type. Thorax with dorsal hairs weak and pale, mostly rubbed off in type; scutellum with four pale marginal bristles; propleura with some fine hairs below; metapleura bare. Abdomen slender, hypopygium of above average in size, rather sharply keeled below. Legs without bristles; fore metatarsus wider than apex of tibia. Upper vein emanating from apex of discal cell about one and a half times as long as that cell.

Length, 2 mm.

Type, Como, N.S.W., December, 1923, swept from flowers (H. Petersen). Submitted by the late C. F. Baker and in collection of author.

## Genus RHAMPIOMYIA Meigen.

This genus is a very large one and has recently been broken into a number of subgenera by Frey and Collin. It has been mentioned as occurring in Australia by Tillyard in his book on Australian and New Zealand insects, but no species has been described from this country up to the present. Collin does not record it for New Zealand, though I have before me one species from there.

## RHAMPHOMYIA ALBIDIPENNIS, n. sp.

♂. Shining black, with milk-white wings, whitish calyptrae, and pale knobs to the halteres. Antennae and palpi black. Thorax slightly and evenly grey-dusted, with three indistinct blackish vittae on dorsum. Costal vein and apex of first vein blackish, the other veins pale. Fringes of calyptrae pale. Body and leg hairs and setulae black.

Eyes touching on about three-fourths of the extent of frons, ocellar triangle not noticeably elevated, the ocellar setulae very short and weak; third antennal segment broken off in type; proboscis not as long as height of head, eyes notched at base of antennae. Thorax rather elevated, with fine erect biseriate acrostichals and the dorsocentral series closely set and hardly stronger than the acrostichals, except posteriorly; collar with two or three hairs on each side above and one longer hair on each side below; propleural hairs not numerous; scutellum with two well developed apical marginal bristles; notopleural region with two posterior bristles and some weaker and shorter setulae in front of them and closer to margin; metapleural bristles in a single vertical series of about six. Abdomen normal, with short dark hairs, the hypopygium slightly keeled, higher than long. Legs normal, all tibiae with distinct setulose hairs amongst which there are two or three on the anterodorsal and posterodorsal surfaces of each distinctly longer than the others but not much longer than the diameter of the tibiae; fore tarsus normal; all tarsi with the claws long, equal, and curved. Wing much as in *aprilis* White, but without a dark stigmal spot, and with the discal cell comparatively longer than in that author's figure, the length of it being about three-fifths that of the upper vein emanating from its apex instead of less than one-half; sixth vein obsolete except at base.

Length, 3 mm.

Type, Seaford, Vict., no other data (W. F. Hill).

## Subfamily HEMERODROMIINAE.

The genus *Ptilophyllostromia* Bezzi occurs in Australia. It is known from other genera by the plumose apical antennal arista. I have not seen the genus.

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